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EXAMINER
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* SEYED-ALIREZA SEYEDI-ESFAHANI

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Appeal 2016-005555  
Application 12/522,942  
Technology Center 2600

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Before ROBERT E. NAPPI, THU A. DANG, and  
JENNIFER L. McKEOWN, *Administrative Patent Judges*.

DANG, *Administrative Patent Judge*.

DECISION ON APPEAL

I. STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1–16, which are all of the pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

A. INVENTION

According to Appellant, the invention “pertains to the field of data communications,” and “more particularly, to a system and method of interleaving bits or symbols, suitable for deployment in a variety of transmission systems” (Spec. ¶ 3).

## B. EXEMPLARY CLAIMS

Claim 1 is exemplary:

1. A method for interleaving successive data portions comprising a first sequence of data portions to provide an interleaved second sequence of data portions, the method comprising steps of:
  - writing respective successive data portions of said first sequence of data portions to a rectangular matrix, stored in a memory, according to a diagonal write pattern;
  - reading said successive data portions from the rectangular matrix in said memory according to a diagonal read pattern using a diagonal direction opposite to the diagonal direction of the diagonal write pattern, thereby interleaving the successive data portions of said first sequence;
  - outputting said second sequence comprising said successive interleaved data portions.

## C. REJECTION

Claims 1–4 and 8–14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lin et al. (US 7,434,138 B2, issued Oct. 7, 2008) and Lee (US 6,788,617 B1; issued Sept. 7, 2004).

Claims 5–7, 15 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lin, Lee and Lai (US 2004/0146123 A1; published July 29, 2004).

## II. ISSUES

The principal issues before us are whether the Examiner erred in finding that the combination of Linn and Lee teaches or suggests “*writing* respective successive data portions of said first sequence of data portions ... *to a diagonal write pattern*” and “*reading* said successive data portions... using a diagonal direction *opposite* to the diagonal direction of the diagonal

write pattern, thereby interleaving the successive data portions... ” (claim 1, emphasis added).

### III. FINDINGS OF FACT

The following Findings of Fact (FF) are shown by a preponderance of the evidence.

#### *Lin*

1. Lin discloses a structured interleaving/de-interleaving scheme (Abstract), which includes arranging the original sequence of original values into the original block such that the original block corresponds to the original sequence arranged in a first diagonal pattern in the original block (col. 10, l. 66 to col. 11, l. 3; claim 2). A codeword corresponds to values in an augmented block read out in a second diagonal pattern such that the original data values appear in the codeword in the original sequence interleaved with particular row and volume parity values (col. 11, ll. 4–8; claim 3).

#### *Lee*

2. Lee discloses using an interleaver for minimizing a burst error of the data transmitted in a CDMA type communication system (col. 1, ll. 20–22). In a preferred embodiment, memory reading addresses are generated in a direction opposite to the direction of the memory writing addresses (col. 5, ll. 47–49).

### IV. ANALYSIS

In reaching this decision, we consider all evidence presented and all arguments actually made by Appellant. We do not consider arguments that

Appellant could have made but chose not to make in the Briefs, and we deem any such arguments waived. 37 C.F.R. § 41.37(c)(1)(iv).

Appellant contends that Appellant “has defined the meaning of the term using examples in the specification” (App. Br. 11). In particular, Appellant contends “a first diagonal direction [is] defined from top-left to bottom right along and parallel to the main diagonal” and “a second diagonal direction [is] defined from top-right to bottom-left along and parallel to the counter-main or anti-main diagonal” (*id.*, citing “portions of the specification related” to “exemplary Figures 4 and 7”). According to Appellant, “[t]he meaning of ‘opposite’ for the two diagonal directions, as defined specifically by Appellant and therefor as applied in the claims” results in “one diagonal direction commonly known in the art as the main diagonal together with those diagonals parallel to it and a second diagonal direction commonly known in the art as the counter-main or anti-main diagonal together with those diagonals parallel to it” (App. Br. 13).

Appellant also contend “[t]here is no difference presented by Lin between his first diagonal pattern for arranging and the second diagonal pattern for reading” (*id.*). Further, Appellant contend “Lee does not mention or define diagonals for his row and column addressing approach” (App. Br. 14). Thus, although Appellant concedes Lin performs interleaving using diagonal patterns, Appellant contends “the application of Lee to Lin would modify the structure of Lin in such a way that Lin would operate unsatisfactorily for its intended purpose” (App. Br. 15). According to Appellant, “Appellant’s oppositely directed diagonal patterns for writing and read[], ... result in an interleaving method and in an interleaving apparatus that solves the prior art problems by avoiding periodic or nearly periodic

characteristics” but “Lin and Lee say nothing about periodicity in the interleaved sequence and problems created by such periodicity” (App. Br. 14).

Based on the record before us, we disagree with Appellant’s contentions regarding the Examiner’s rejections of the claims. Instead, we agree with the Examiner’s findings, and find no error with the Examiner’s conclusion that the claims would have been obvious over the combined teachings.

As an initial matter of claim construction, we give the claim its broadest reasonable interpretation consistent with the Specification. *See In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). However, “limitations are not to be read into the claims from the specification.” *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993) (citations omitted).

We agree with the Examiner that “[t]he claim language is absent as to what is meant by ‘opposite’” (Ans. 10). Although Appellant contends “a first diagonal direction” is specified in the Specification as “from top-left to bottom right along and parallel to the main diagonal,” and “a second diagonal direction” is specified as “from top-right to bottom-left along and parallel to the counter-main or anti-main diagonal” (App. Br. 11), the terms “top-left to bottom right,” “parallel to the main diagonal,” “top-right to bottom-left,” and “parallel to the counter-main” are not recited in the claims (claim 1). As the Examiner points out, “such read/write pattern is not recited in the claims” (Ans. 9). In fact, claim 1 does not even recite “first diagonal direction” and “second diagonal direction.”

Although Appellant contends that Appellant “has defined the meaning of the term using examples in the specification” by referring to “portions of

the specification related” to “exemplary Figures 4 and 7” of the Specification (App. Br. 11), descriptions of exemplary embodiments of “first diagonal direction” and “second diagonal direction” in the Specification are not express definitions. We will not read exemplary embodiments into the claims, but instead, we give “opposite to the diagonal direction” its broadest reasonable interpretation consistent with the Specification. *In re Van Geuns*, 988 F.2d at 1184. Thus, because we find no express definition in the Specification, we conclude a broad but reasonable interpretation of the contested claim term “opposite to the diagonal direction” covers any diagonal direction that is opposite to, i.e., reverse from the diagonal direction for writing, within the scope of claim 1.

Although Appellant contends “[t]here is no difference presented by Lin between his first diagonal pattern for arranging and the second diagonal pattern for reading” and that “Lee does not mention or define diagonals for his row and column addressing approach” (App. Br. 13–14), the test for obviousness is what the combined teachings would have suggested to one of ordinary skill in the art. *See In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

Here, we agree with the Examiner’s finding that Lin discloses an “interleaving scheme” which includes “reading in ‘first diagonal pattern’ and writing in ‘second diagonal pattern’” (Final Act. 5–6; FF 1). In fact, Appellant concedes Lin performs interleaving using diagonal patterns (App. Br. 15). Thus, we agree with the Examiner’s reliance on Lin for teaching and suggesting “writing respective successive data portions of said first sequence of data portions . . . to a diagonal write pattern” and “reading said

successive data portions . . . using a diagonal direction . . . , thereby interleaving the successive data portions . . . ” (claim 1).

The Examiner concedes that Lin’s diagonal read pattern is not “opposite to the diagonal direction of the diagonal write pattern,” however, the Examiner relies on Lee for disclosing and suggesting “reading and writing data in ‘opposite’ direction” (Ans. 10). In particular, Lee discloses reading in a direction opposite to the direction of writing (FF 2). Thus, we are unpersuaded that the Examiner erred in finding that the *combination* of Lin and Lee “together disclose reading and writing in opposite diagonal directions” (Ans. 9).

Although Appellant contends “the application of Lee to Lin would modify the structure of Lin in such a way that Lin would operate unsatisfactorily for its intended purpose” (App. Br. 15), Appellant appears to view the combination in a different perspective than that of the Examiner. The issue here is not whether one of ordinary skill in the art would have bodily incorporated the structure of Lee into the structure of Lin, but rather, whether the ordinarily skilled artisan would have found it obvious to modify Lin’s teaching of having different reading and writing in diagonal directions, to provide “opposite” read and write directions as taught by Lee. We agree with the Examiner both Lin and Lee are from the same field of endeavor of “signal processing and interleaving” (Ans. 10), and find no error with the Examiner’s conclusion that it would have been obvious to apply the “opposite” direction of Lee to the reading and writing directions of Lin “to avoid complications in hardware as detailed [in Lee]” (Final Act. 6).

The Supreme Court has clearly stated the “combination of familiar elements according to known methods is likely to be obvious when it does



no more than yield predictable results.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 416 (2007). The skilled artisan is “a person of ordinary creativity, not an automaton.” *Id.* at 421.

As to Appellant’s contention that “Lin and Lee say nothing about periodicity in the interleaved sequence and problems created by such periodicity” solved by Appellant’s invention (App. Br. 14), in *KSR*, the Supreme Court held, “[i]n determining whether the subject matter of a patent claim is obvious, neither the particular motivation nor the avowed purpose of the patentee controls.” *KSR*, 550 U.S. at 419. For a *prima facie* case of obviousness to be established, the reference need not recognize the same problem solved by Appellant. *See In re Kemps*, 97 F.3d 1427, 1430 (Fed. Cir. 1996); *In re Beattie*, 974 F.2d 1309, 1312 (Fed. Cir. 1992); *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Int. 1985) (“The fact that appellant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious.”).

Here, Appellant has presented no persuasive evidence that combining Lee’s teaching of providing “opposite” read and write directions (FF 2) with Lin’s separate diagonal read and write directions (FF 1) would have been “uniquely challenging or difficult for one of ordinary skill in the art.” *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 418). Instead, we conclude that it would have been well within the skill of one skilled in the art to combine the references. *See KSR*, 550 U.S. at 417. That is, we find that Appellant’s invention is simply a modification of familiar prior art teachings (as taught

or suggested by the cited references) that would have realized a predictable result, *KSR*, 550 U.S. at 421.

On this record, we are unconvinced of Examiner error in the rejection of independent claim 1, and claims 2, 3, and 8–10 depending therefrom (App. Br. 16) over Lin and Lee. Appellant does not provide substantive arguments for independent claims 4, and 11–14 separate from claim 1 (App. Br. 17–25). Thus, we also affirm the rejections of these claims over Lin and Lee.

As for claims 5–7, 15, and 16, Appellant merely contends “Lai would still fail to cure the deficiency in the Teachings of the combination of Lin and Lee discussed above with respect to the independent claims” (App. Br. 26). As we find no deficiency with the Examiner’s reliance on Lin and Lee, we also affirm the rejection of claims 5–7, 15, and 16 over Lin and Lee, in further view of Lai.

## V. CONCLUSION AND DECISION

We affirm the Examiner’s rejection of claims 1–16 under 35 U.S.C. § 103(a).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED